

I Claim:

- 1           1.     Apparatus for sensing temperature of an object in contact with a  
2     reference surface, the apparatus comprising:  
3           a sensing element resiliently mounted within a recess in the reference surface  
4     to contact an object disposed on the reference surface;  
5           photoluminescent material disposed on the sensing element to emit luminous  
6     flux in response to energetic excitation thereof; and  
7           an optical channel having one end positioned relative to the sensing element  
8     to transfer luminous flux therebetween, and having an opposite end disposed to  
9     optically couple to optical analysis apparatus for sensing luminous flux supplied  
10    thereto from the optical channel.
- 1           2.     Apparatus as in claim 1 including a substantially planar spring  
2     disposed within the recess of substantially cylindrical configuration to resiliently  
3     support the sensing element in substantially coaxial orientation within the recess.
- 1           3.     Apparatus as in claim 2 in which the spring is configured as a disc  
2     disposed within the recess substantially co-planarly with the reference surface for  
3     resiliently supporting the sensing element to produce resilient force thereon in a  
4     direction toward the reference surface which increases non-linearly with deflection  
5     away from the reference surface.

1           4.     Apparatus as in claim 2 including photoluminescent material disposed  
2     on the sensing element for emitting radiant flux with an intensity characteristic that  
3     is indicative of temperature in response to stimulation thereof with radiant energy;  
4     and including

5           an optical channel having a proximal end disposed near the sensing element  
6     for transferring radiant flux between the proximal end and a remote end of the  
7     optical channel.

1           5.     Apparatus as in claim 4 in which the optical channel includes a first  
2     portion adjacent the proximal end, and a second portion adjacent the remote end;  
3     and including

4           a coupling structure disposed intermediate the proximal and remote ends for  
5     selectively optically coupling together the first and second portions of the optical  
6     channel.

1           6.     Apparatus as in claim 4 including analyzer apparatus optically  
2     coupled to the remote end of the optical channel for selectively supplying  
3     successive pulses of radiant energy thereto and for receiving via the optical  
4     channel during intervals between pulses the radiant flux emitted by the  
5     photoluminescent material in response to pulses of radiant energy supplied thereto.

1           7.     Apparatus as in claim 6 in which the analyzer apparatus responds to  
2     the characteristic of rate of change of intensity of radiant flux emitted by the  
3     photoluminescent material on the sensing element to determine the temperature  
4     thereof.